

EXPEDITED PROCEDURE
RESPONSE UNDER 37 CFR § 1.116—EXAMINING GROUP 2827

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PATENT APPLICATION**

Application No.: 09/683,027 Atty. Docket: BUR9-2000-0228-US1
Applicant: Malinowski et al. Today's Date: December 9, 2002
Filing Date: November 9, 2001 Examiner: Luan C. Thai
Title: **DUAL CHIP STACK METHOD FOR Group Art Unit: 2827
ELECTRO-STATIC DISCHARGE Fax: 703-872-9319
PROTECTION OF INTEGRATED CIRCUITS**

Amendments After Final Under 37 CFR 1.116

Amendment B

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

In response to the Final Office Action dated November 5, 2002, Applicants respectfully request reconsideration of the outstanding rejection of claims in view of the amendments and remarks that follow. No fee is due by virtue of this amendment. However, if the PTO determines that a fee is required, please charge Applicants' Deposit Account, 09-0456.

CERTIFICATE OF MAILING

I hereby certify that, on the date shown below, this correspondence is being:

MAIL

deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, DC 20231.

Date: 12/09/2002

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ANTHONY J. CANALE

Name
Anthony J. Canale
Signature

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Please amend the application identified above as follows:

IN THE CLAIMS

Please cancel claims 34-40, without prejudice or disclaimer.

Please amend claims 1, 4, 8, 12, 15, 23, 26 and 30 as follows:

1. (Twice Amended) An electronic device comprising:
 - a semiconductor chip including an integrated circuit having at least one electrostatic discharge sensitive device; and
 - a non-semiconductor chip having a substrate formed of an electrically insulating material, positioned in close proximity to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge protection device formed on said substrate, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

4. (Twice Amended) An electronic device comprising:
 - a semiconductor chip including an integrated circuit; and
 - a non-semiconductor chip having a substrate formed of an electrically insulating material, positioned in close proximity to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge sensitive device formed on said substrate and at least one electrostatic discharge protection device, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

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8. (Twice Amended) An electronic device comprising:

a semiconductor chip including an integrated circuit having at least one first electrostatic discharge sensitive device; and

a non-semiconductor chip having a substrate formed of an electrically insulating material, positioned in close proximity to said semiconductor chip, said non-semiconductor chip having at least one second electrostatic discharge sensitive device and at least one first electrostatic discharge protection device and at least one second electrostatic discharge protection device formed on said substrate, said first electrostatic discharge protection device electrically connected to said first electrostatic discharge sensitive device and said second electrostatic discharge protection device electrically connected to said second electrostatic discharge sensitive device.

12. (Twice Amended) An electronic device comprising:

a dual chip stack comprising:

a semiconductor chip including an integrated circuit having at least one electrostatic discharge sensitive device; and

a non-semiconductor chip having a substrate formed of an electrically insulating material, attached to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge protection device formed on said substrate, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

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15. (Twice Amended) An electronic device comprising:
 - a dual chip stack comprising:
 - a semiconductor chip including an integrated circuit; and
 - a non-semiconductor chip having a substrate formed of an electrically insulating material, attached to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge sensitive device and at least one electrostatic discharge protection device formed on said substrate, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.
23. (Twice Amended) An electronic device comprising:
 - a dual chip stack mounted on a module, said dual chip stack comprising:
 - a semiconductor chip including an integrated circuit having at least one electrostatic discharge sensitive device; and
 - a non-semiconductor chip having a substrate formed of an electrically insulating material, attached to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge protection device formed on said substrate, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

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26. (Twice Amended) An electronic device comprising:

a dual chip stack mounted on a module, said dual chip stack comprising:

a semiconductor chip including an integrated circuit; and

a non-semiconductor chip having a substrate formed of an electrically insulating material, attached to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge sensitive device and at least one electrostatic discharge protection device formed on said substrate, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

30. (Twice Amended) An electronic device comprising:

a dual chip stack mounted on a module, said dual chip stack comprising:

a semiconductor chip including an integrated circuit having at least one first electrostatic discharge sensitive device; and

a non-semiconductor chip having a substrate formed of an electrically insulating material, positioned in close proximity to said semiconductor chip, said non-semiconductor chip having at least one second electrostatic discharge sensitive device and at least one first electrostatic discharge protection device and at least one second electrostatic discharge protection device formed on said substrate, said first electrostatic discharge protection device electrically connected to said first electrostatic discharge sensitive device and said second electrostatic discharge protection device electrically connected to said second electrostatic discharge sensitive device.

REMARKS**In the Claims**

Applicants respectfully request entry of the amendments to claims 1, 4, 8, 12, 15, 23, 26 and 30 as set forth herein to place the present application in condition for allowance or in better condition for purposes of appeal. No new matter has been added to the application by virtue of the present amendment. Applicants believe the present amendment does not raise new issues requiring further search by the Examiner.

Claims 1-33 are pending in the subject application, and all of such claims stand rejected. It is respectfully requested that the pending claims be reconsidered and passed to issuance in view of this response.

Claim Rejections - 35 U.S.C. 112, first paragraph

The Examiner has rejected claims 1-33 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicants respectfully request that claims 1, 4, 8, 12, 15, 23, 26 and 30 be amended as set forth herein in order to more clearly define Applicants' invention. Applicants have amended claims 1, 4, 8, 12, 15, 23, 26 and 30 to include the limitation of "... a non-semiconductor chip having a substrate formed of an electrically insulating material ...". Support for Applicants' amendments can be found, for example, in paragraphs [0046] - [0057] and with reference to FIGS. 4-6.

Applicants teach non-semiconductor chip 120 having a substrate formed of an electrically insulating material such as, for example, quartz. Applicants disclose that electrostatic discharge protection device 145 is formed on the substrate of non-semiconductor chip 120 as shown, for example, in FIGS. 5A-5D. In addition, Applicants disclose that ESD protection device 145 may be formed of electrically conductive materials such as aluminum, copper and tungsten (paragraph [0048]). Thus, Applicants teach forming electrically conductive layers on an electrically insulating substrate using known semiconductor processes to form electrical devices, such as ESD protection devices.

Therefore, Applicants respectfully submit that the rejections under 35 U.S.C. 112, first paragraph, have been overcome.

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Attached hereto is a marked-up version of the changes made to the claims by the present amendment. The attachment is captioned "Version with markings to show changes made".

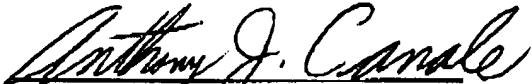
In light of the foregoing amendments and remarks, all of the claims now presented are believed to be in condition for allowance, and Applicants respectfully request that the outstanding rejections be withdrawn and this application be passed to issue at an early date.

The Examiner is urged to call the undersigned at the number listed below if, in the Examiner's opinion, such a phone conference would aid in furthering the prosecution of this application.

Respectfully Submitted,

For: Malinowski et al.,

By:



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Please cancel claims 34-40, without prejudice or disclaimer.

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a non-semiconductor chip having a substrate formed of an electrically insulating material, positioned in close proximity to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge protection device formed on said substrate, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

4. (Twice Amended) An electronic device comprising:
a semiconductor chip including an integrated circuit; and
a non-semiconductor chip having a substrate formed of an electrically insulating material, positioned in close proximity to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge sensitive device formed on said substrate and at least one electrostatic discharge protection device, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

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8. (Twice Amended) An electronic device comprising:
 - a semiconductor chip including an integrated circuit having at least one first electrostatic discharge sensitive device; and
 - a non-semiconductor chip having a substrate formed of an electrically insulating material, positioned in close proximity to said semiconductor chip, said non-semiconductor chip having at least one second electrostatic discharge sensitive device and at least one first electrostatic discharge protection device and at least one second electrostatic discharge protection device formed on said substrate, said first electrostatic discharge protection device electrically connected to said first electrostatic discharge sensitive device and said second electrostatic discharge protection device electrically connected to said second electrostatic discharge sensitive device.
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 - a dual chip stack mounted on a module, said dual chip stack comprising:
 - a semiconductor chip including an integrated circuit having at least one electrostatic discharge sensitive device; and
 - a non-semiconductor chip having a substrate formed of an electrically insulating material, attached to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge protection device formed on said substrate, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

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26. (Twice Amended) An electronic device comprising:

a dual chip stack mounted on a module, said dual chip stack comprising:
a semiconductor chip including an integrated circuit; and
a non-semiconductor chip having a substrate formed of an electrically insulating material, attached to said semiconductor chip, said non-semiconductor chip having at least one electrostatic discharge sensitive device and at least one electrostatic discharge protection device formed on said substrate, said electrostatic discharge protection device electrically connected to said electrostatic discharge sensitive device.

30. (Twice Amended).An electronic device comprising:

a dual chip stack mounted on a module, said dual chip stack comprising:
a semiconductor chip including an integrated circuit having at least one first electrostatic discharge sensitive device; and
a non-semiconductor chip having a substrate formed of an electrically insulating material, positioned in close proximity to said semiconductor chip, said non-semiconductor chip having at least one second electrostatic discharge sensitive device and at least one first electrostatic discharge protection device and at least one second electrostatic discharge protection device formed on said substrate, said first electrostatic discharge protection device electrically connected to said first electrostatic discharge sensitive device and said second electrostatic discharge protection device electrically connected to said second electrostatic discharge sensitive device.

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